

Collayomi Valley Basin

- Groundwater Basin Number: 5-19
- County: Lake
- Surface Area: 6,500 acres (10 square miles)

Basin Boundaries and Hydrology

The Collayomi Basin includes both Collayomi Valley and Long Valley in the headwater area of Putah Creek. The two northwest-southeast trending valleys are considered a single groundwater basin due to their hydrologic continuity. The basin is bounded to the south by Jurassic-Cretaceous Franciscan, Knoxville, and volcanic rocks; to the west by undifferentiated Cretaceous rocks and Jurassic volcanic rock; to the north and northeast by Plio-Pleistocene Olivine basalt; and to the east by Jurassic volcanics. The basin is underlain by non-water-bearing sedimentary rocks of Jurassic-Cretaceous Franciscan and Knoxville formations which are capped locally by volcanic rocks (DWR 1976). The basin boundary coincides with the edge of the valley floor except where water-bearing landslide debris and Quaternary basalt extend from beneath the valley floor into the uplands. Annual precipitation in the basin ranges from 41- to 47-inches, decreasing to the northeast.

Hydrogeologic Information

Water-Bearing Formations

Nearly all groundwater throughout the Collayomi Basin occurs in Quaternary alluvium deposited as alluvial fans of shallow grade and in the gravel channels of Putah Creek, St. Helena Creek, and their tributaries.

Groundwater occurs in a series of confined, semi-confined, and unconfined layers and lenses of permeable or semi-impermeable materials that are partially merged and interconnected. There is no evidence of any well-defined aquifer of any great areal extent within the basin (DWR 1976). Pleistocene volcanics may also be a source of groundwater in the basin; however, no information is available on storage capacities and well yields within these units.

Quaternary Alluvium. Quaternary alluvium in Collayomi Valley and Long Valley consists primarily of fine-grained deposits of clay and silt. However, alluvium in Collayomi Valley contains some coarse gravel channels and is more conducive to groundwater development in the basin. Along the channels of Putah and St. Helena Creeks, visible shallow deposits consist of fine sand to coarse cobbles and boulders with clean coarse gravel being dominate (Upton 1955). In Long Valley, wells within the alluvial plain consist primarily of fine-grain material with low yields. A well log for Long Valley indicates that the alluvial fill is almost entirely clay from a depth of 64- to 230-feet (Upton 1955). The maximum depths of alluvial fill in Collayomi and Long Valleys are approximately 350 feet and 475 feet respectively (DWR 1976).

Recharge Areas

The major source of recharge to the Collayomi Basin is from percolation of streamflow in Putah Creek, Dry Creek, and St. Helena Creek, although some recharge is derived from infiltration of rainfall and irrigation return flows. Only minor quantities of surface streamflow are available for recharge in the Long Valley portion of the basin; however, streamflow may be impeded by hardpan conditions near the ground surface (DWR 1976).

Groundwater Level Trends

Analysis Incomplete.

Groundwater Storage

Groundwater Storage Capacity. USGS Water Supply Paper 1297 estimates storage capacity in the basin to be approximately 29,000 acre-feet. This is based on the assumptions that alluvium is 100 feet deep over an area of 4,000 acres with specific yield values of 6.5 and 4.5 percent for Collayomi and Long valleys respectively (DWR 1976). DWR (1960) estimates the storage capacity to be 29,000 acre-feet with a useable storage capacity of 7,000 acre-feet.

Groundwater Budget (Type B)

Estimates of groundwater extraction are based on a survey conducted by the California Department of Water Resources in 1995. The survey included land use and sources of water. Estimates of groundwater extraction for agricultural and municipal/industrial uses are 1,000 and 94 acre-feet respectively. Deep percolation from applied water is estimated to be 250 acre-feet.

Groundwater Quality

Characterization. Groundwater in the basin is characterized as magnesium bicarbonate type waters. Total dissolved solids (TDS) range from 150- to 255-mg/L, averaging 202 mg/L (DWR unpublished data).

Impairments. Groundwater impairments include locally high iron and manganese. Locally high boron may be an issue for agricultural uses.

Water Quality in Public Supply Wells

Constituent Group ¹	Number of wells sampled ²	Number of wells with a concentration above an MCL ³
Inorganics – Primary	2	0
Radiological	2	0
Nitrates	2	0
Pesticides	2	0
VOCs and SVOCs	2	0
Inorganics – Secondary	2	0

¹ A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).

² Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.

³ Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

Well yields (gal/min)		
Irrigation	Range: 2 – 1000	Average: 121 (14 Well Completion Reports)
Total depths (ft)		
Domestic	Range: 20 – 465	Average: 128 (103 Well Completion Reports)
Irrigation	Range: 30 – 507	Average: 190 (35 Well Completion Reports)

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
DWR	Groundwater levels	1 well measured semi-annually
Lake County	Groundwater levels	10 wells measured semi-annually
DWR	Miscellaneous water quality	4 wells biennially
Department of Health Services and cooperators	Title 22 water quality	3

Basin Management

Groundwater management:	Lake County has adopted a groundwater management ordinance in 1999.
Water agencies	
Public	Hidden Valley Lake CSD, Middletown County Water District
Private	

Selected References

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Errata

Changes made to the basin description will be noted here.